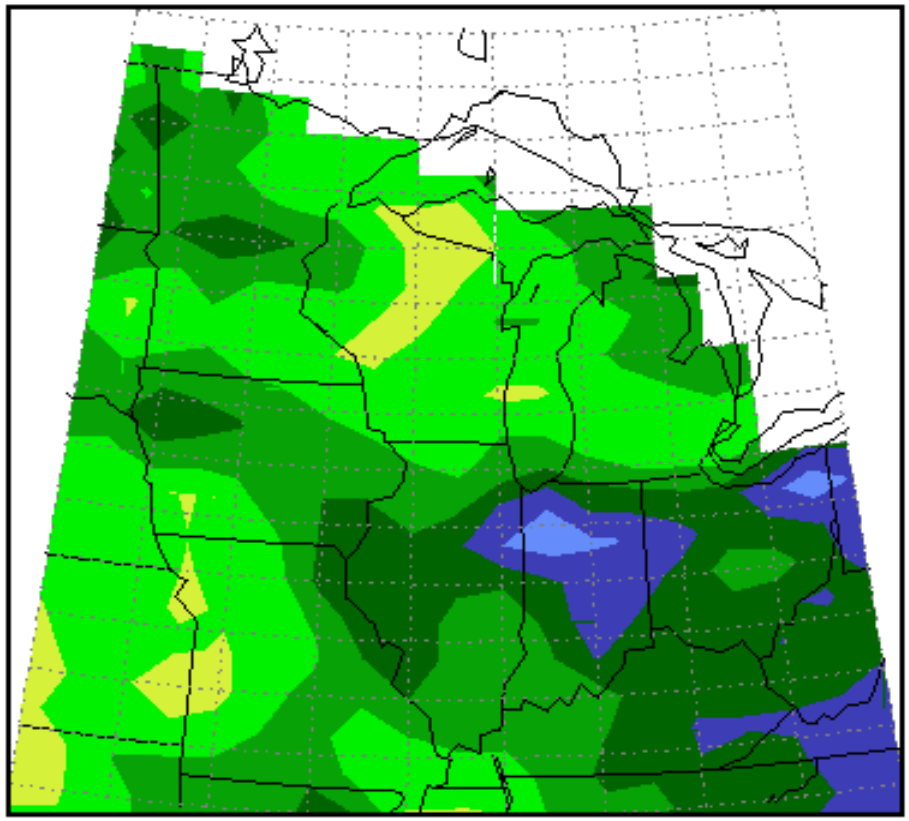
DNR Drought Assessment Committee Meeting
July 29, 2003

Missouri
Department of
Natural Resources

60 DAY

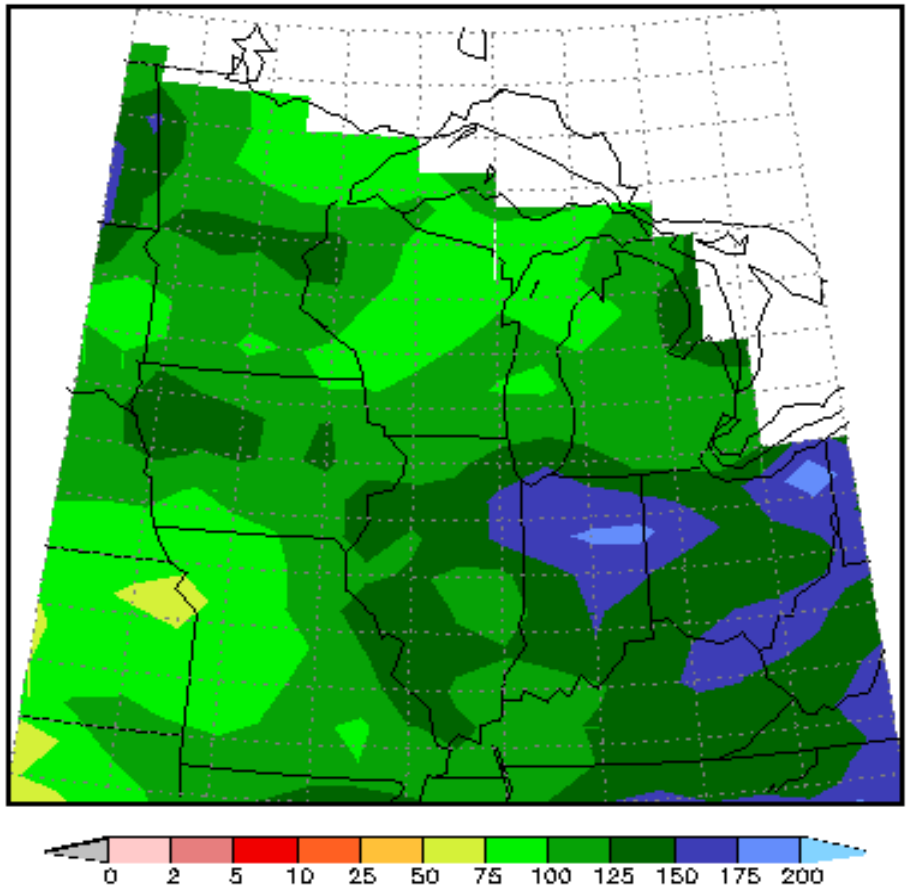
Total Precipitation Percent of Mean
May 29, 2003 to July 28, 2003



Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois

90 DAY

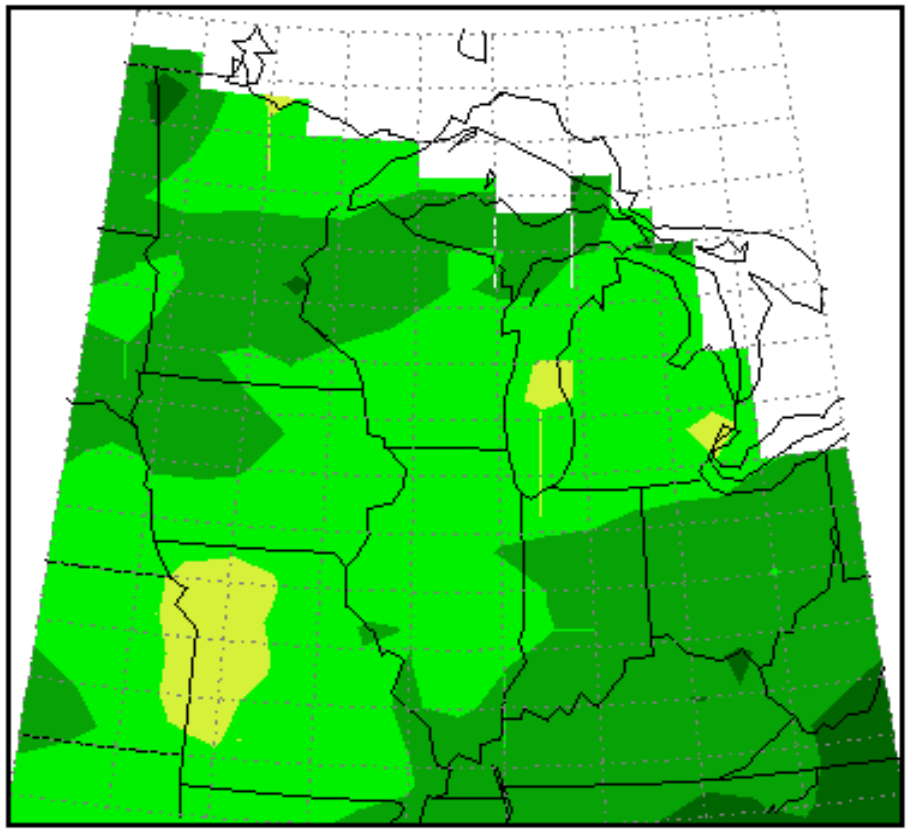
Total Precipitation Percent of Mean
April 29, 2003 to July 28, 2003



Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois

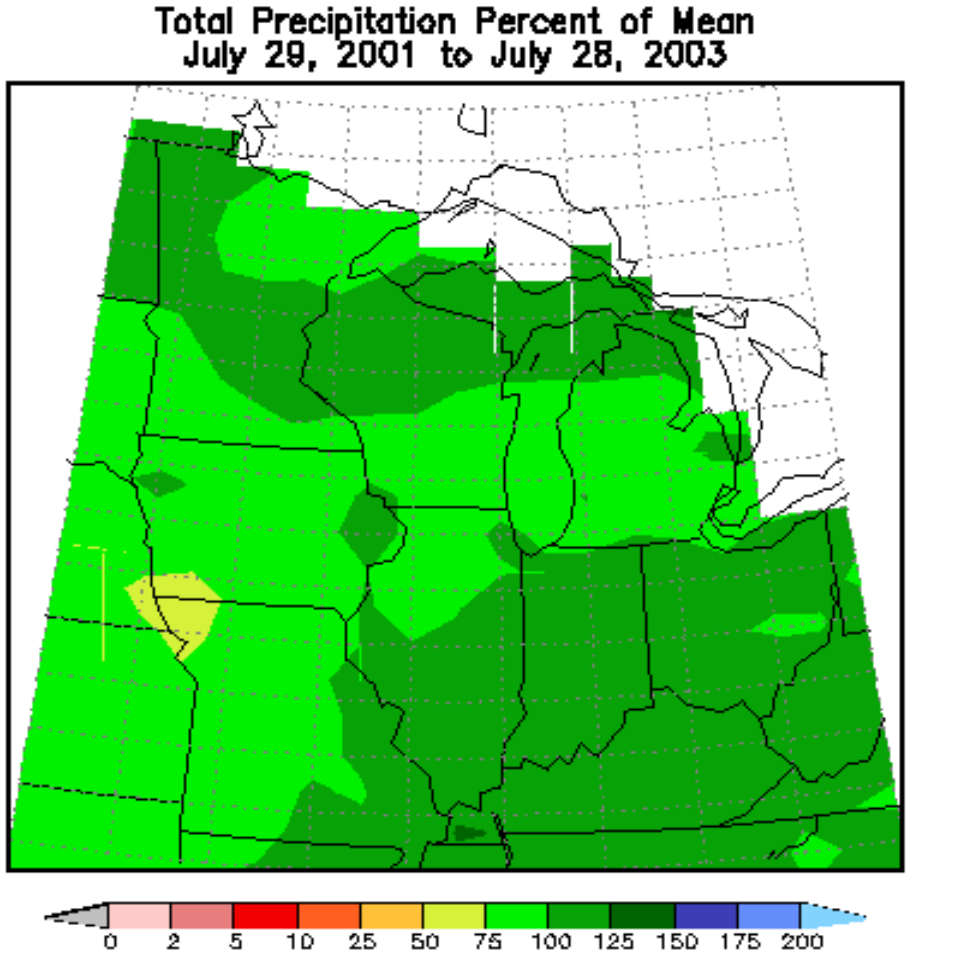
12 MONTH

Total Precipitation Percent of Mean
July 29, 2002 to July 28, 2003



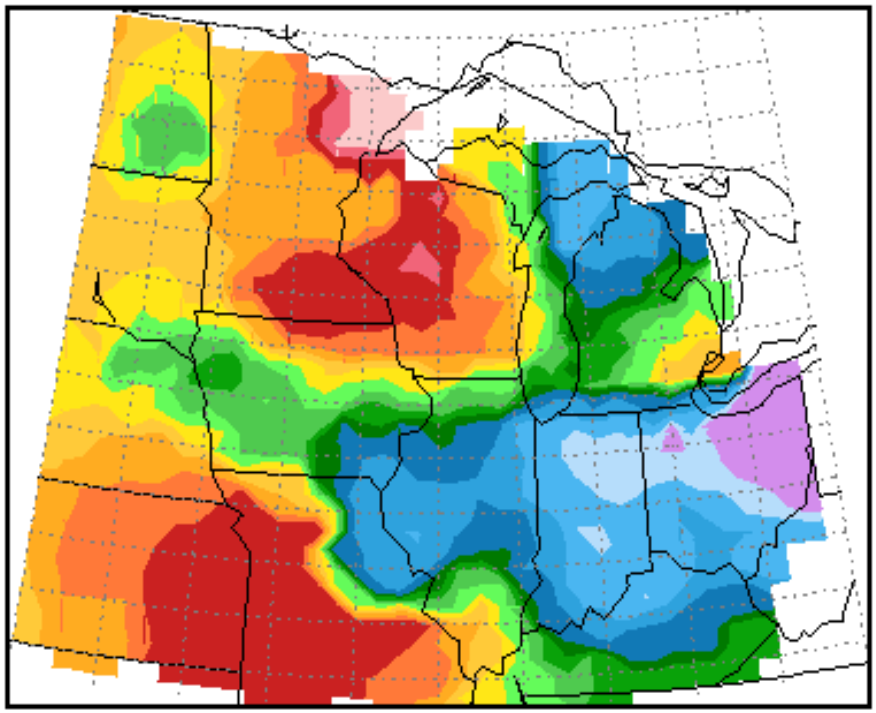
Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois

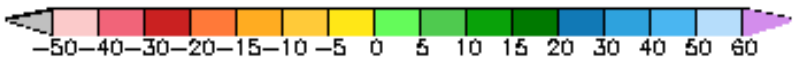
24 MONTH


Total Precipitation Percent of Mean
July 29, 2001 to July 28, 2003
0 2 5 10 25 50 75 100 125 150 175 200
Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois

CURRENT SOIL MOISTURE

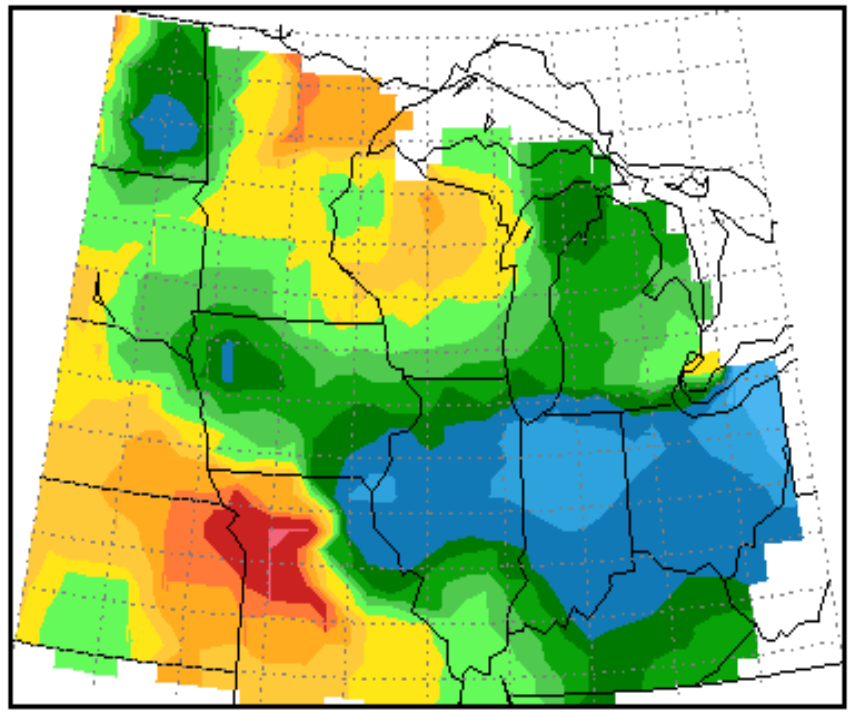
Current Soil Moisture Deviation (%), Depth = 0-12
July-28-2003

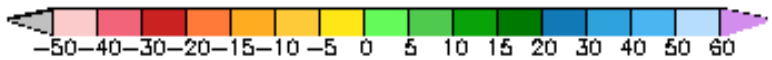




Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois

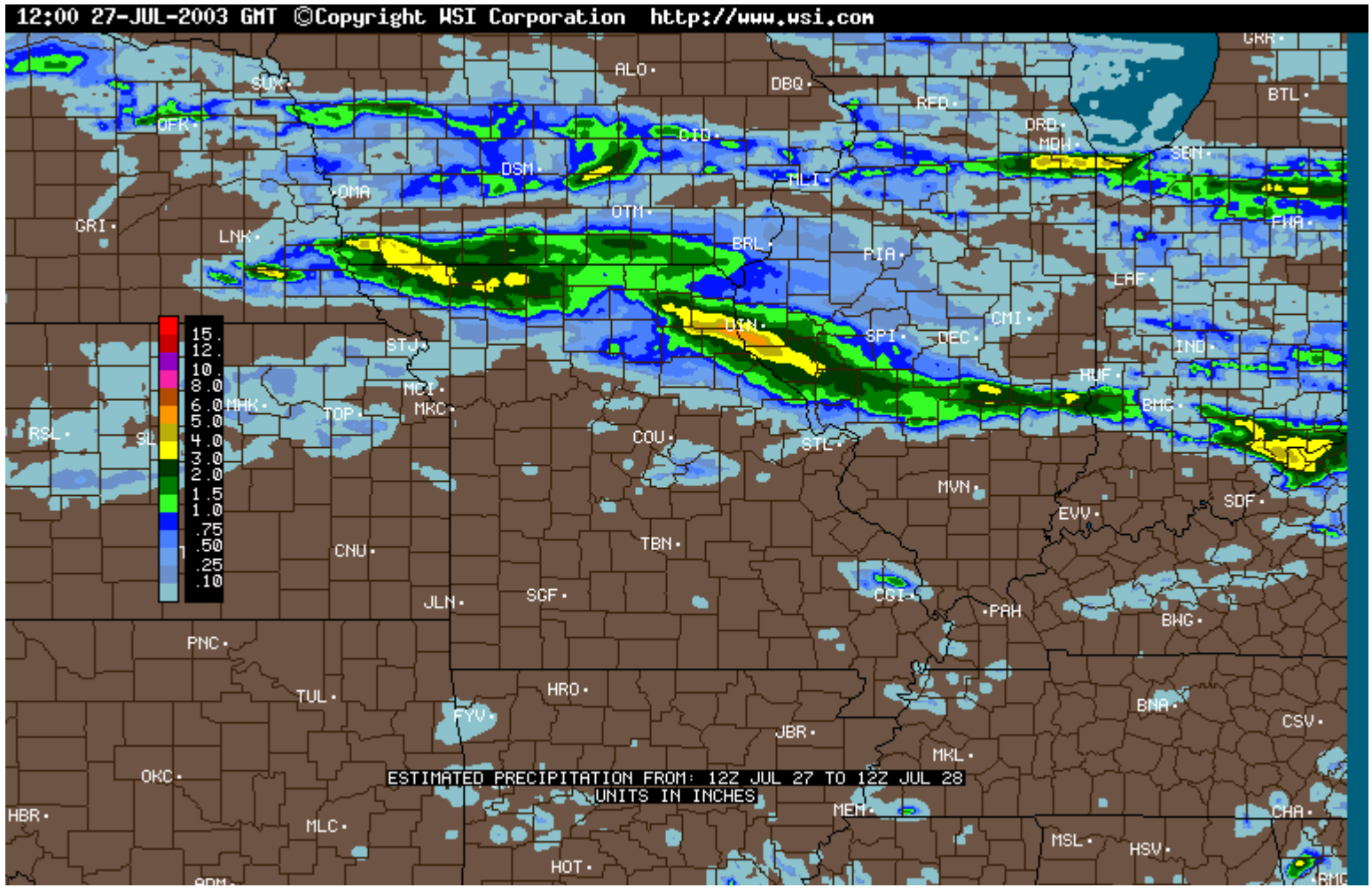
Current Soil Moisture Deviation (%), Depth = 0-72
July-28-2003





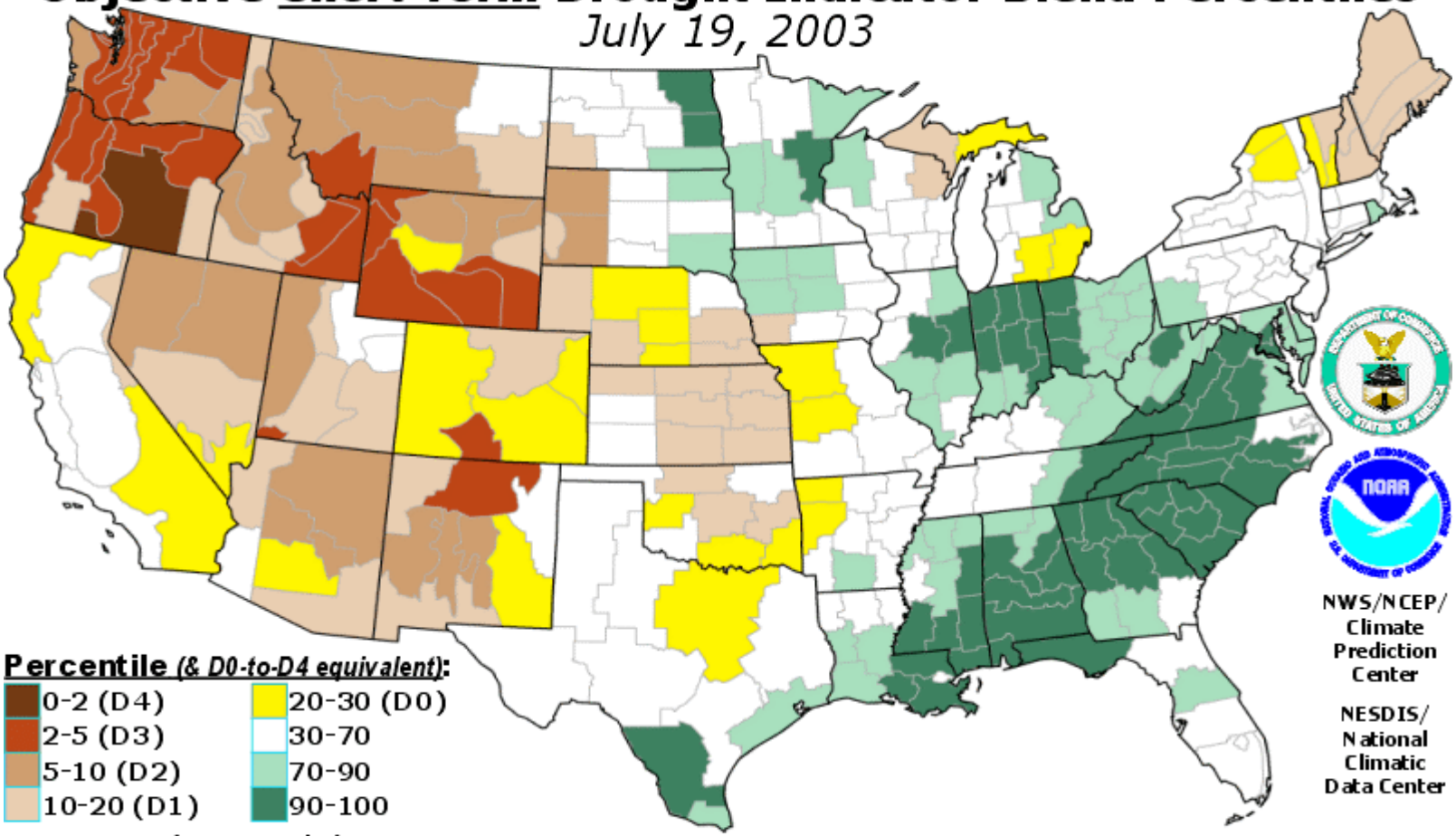
Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois

Estimated Rainfall 12Z to 12Z July 28 / Intellicast



Objective ***Short-Term*** Drought Indicator Blend Percentiles

July 19, 2003



Percentile ***(& D0-to-D4 equivalent)***:

- 0-2 (D4)
- 2-5 (D3)
- 5-10 (D2)
- 10-20 (D1)
- 20-30 (D0)
- 30-70
- 70-90
- 90-100

INPUTS (as Percentiles):

35% Palmer Z-Index
25% 3-Month Precipitation
20% 1-Month Precipitation
13% CPC Soil Model
7% Palmer Drought Index

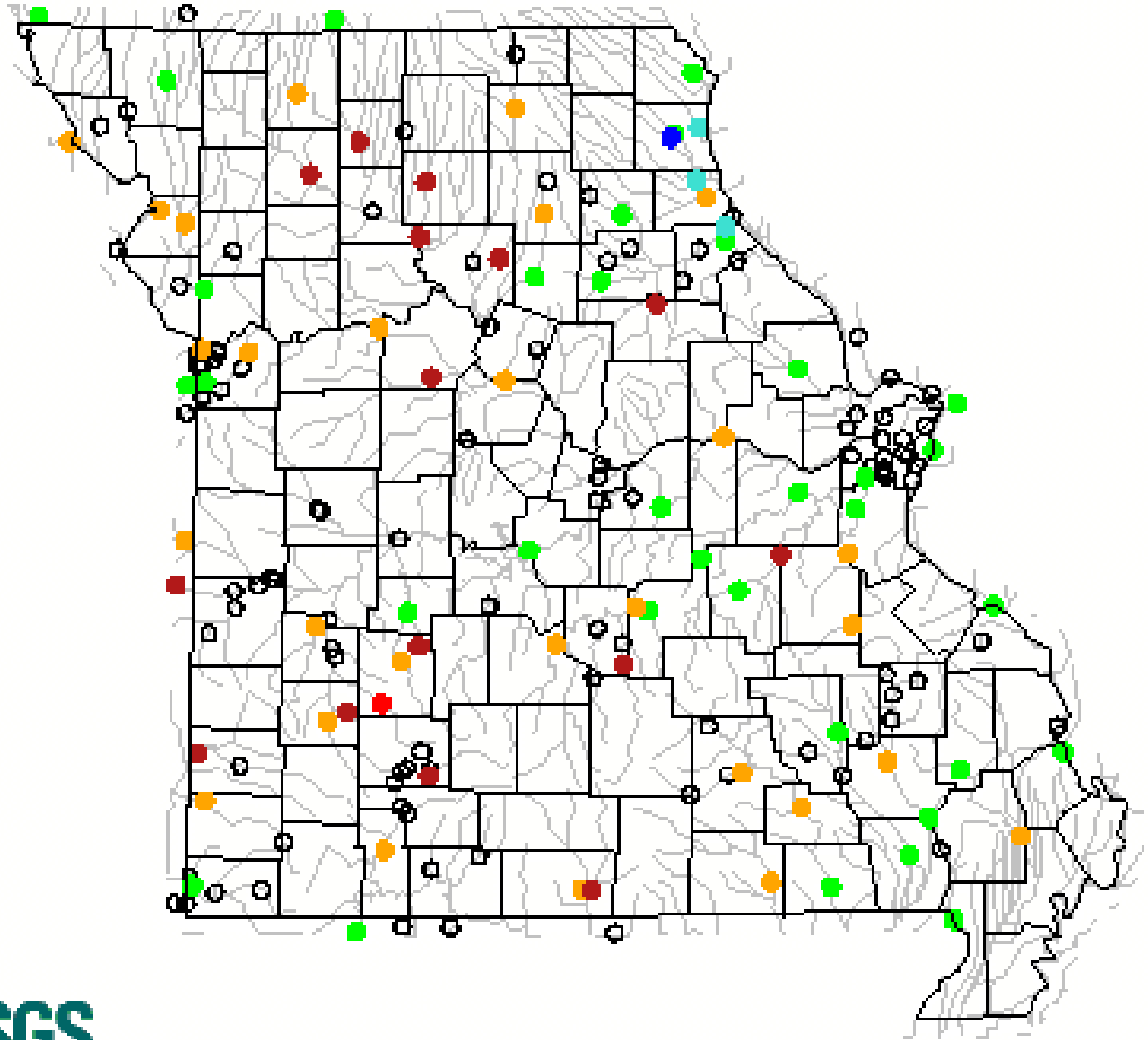
NWS/NCEP/ Climate Prediction Center

NESDIS/ National Climatic Data Center

This map approximates impacts that respond to precipitation over several days to a few months, such as agriculture, topsoil moisture, unregulated streamflows, and most aspects of wildfire danger.

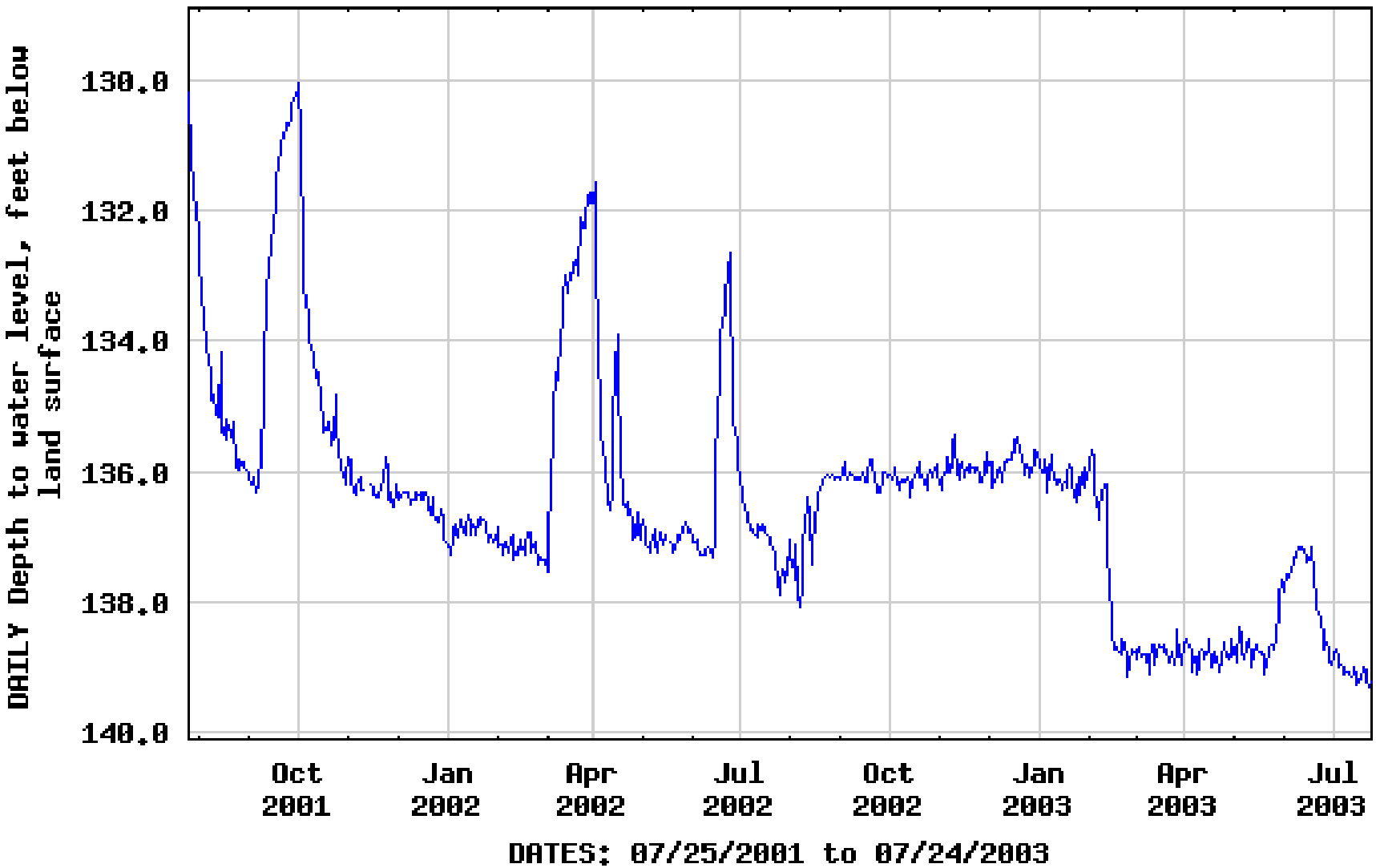
This map is based on preliminary climate division data. Local conditions and/or final data may differ. The relationship between indicators and impacts varies with location and season. Do not interpret this map too literally. See full product description for more details.

Mon., July 28, 2003 11:20ET

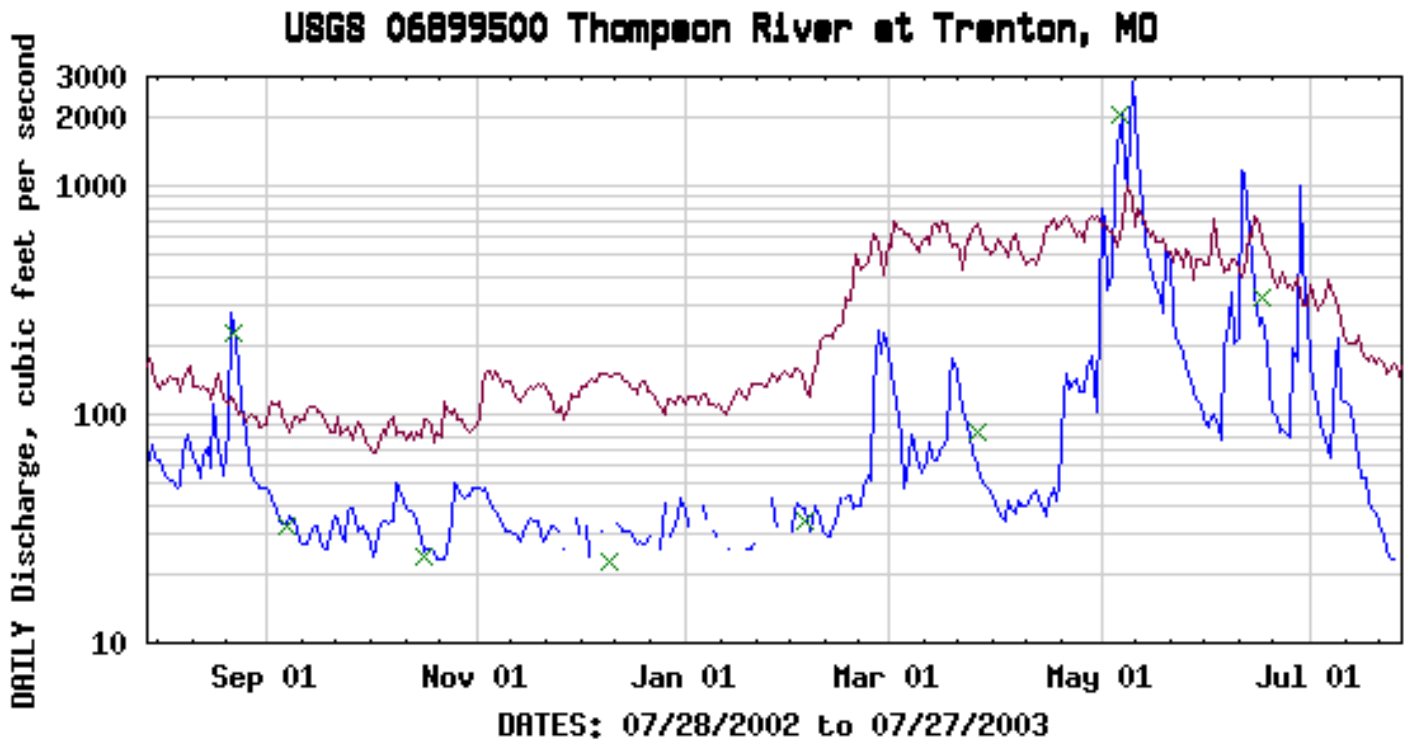


USGS

MODNR Gallatin Water Supply Monitoring Well

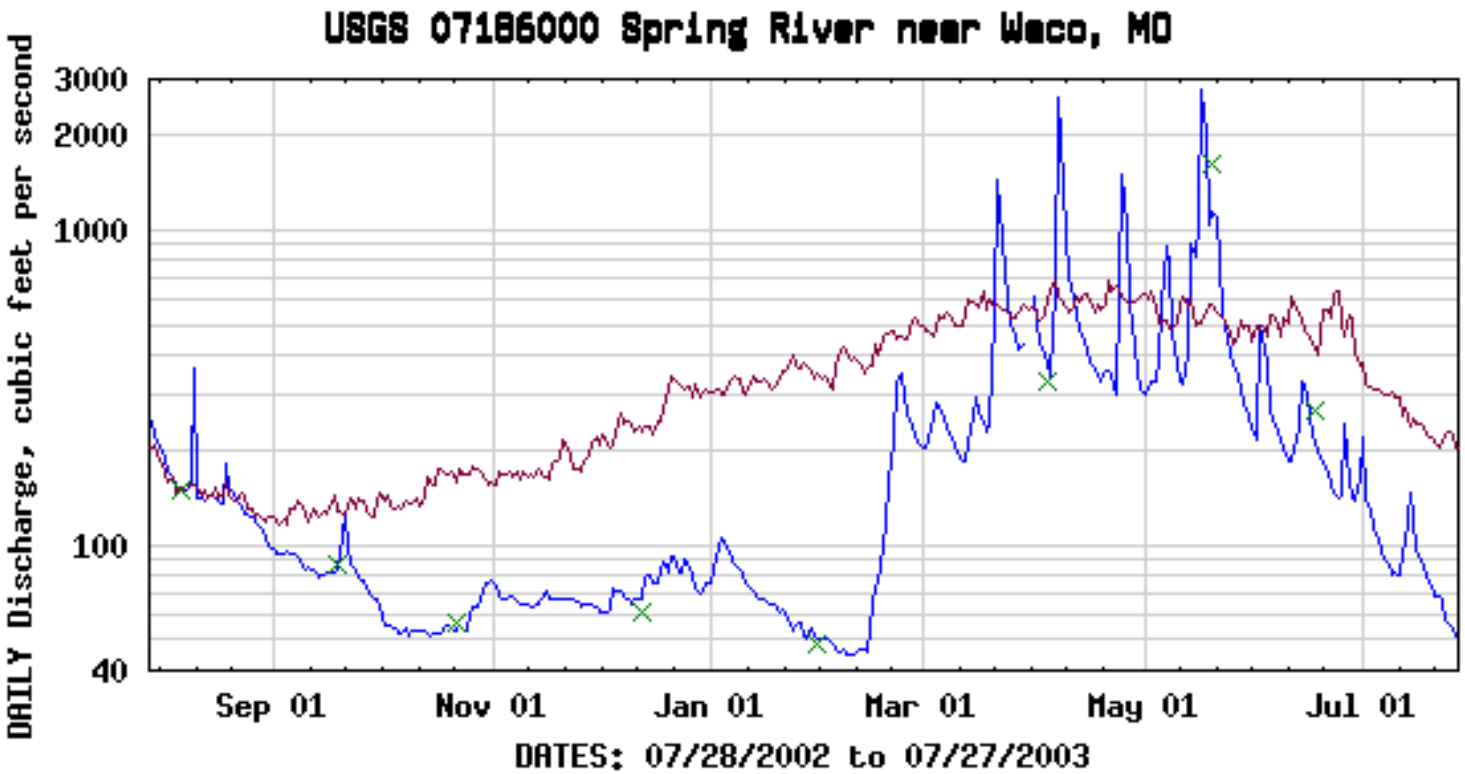


USGS



Provisional Data Subject to Revision

USGS



EXPLANATION

— DAILY MEAN DISCHARGE

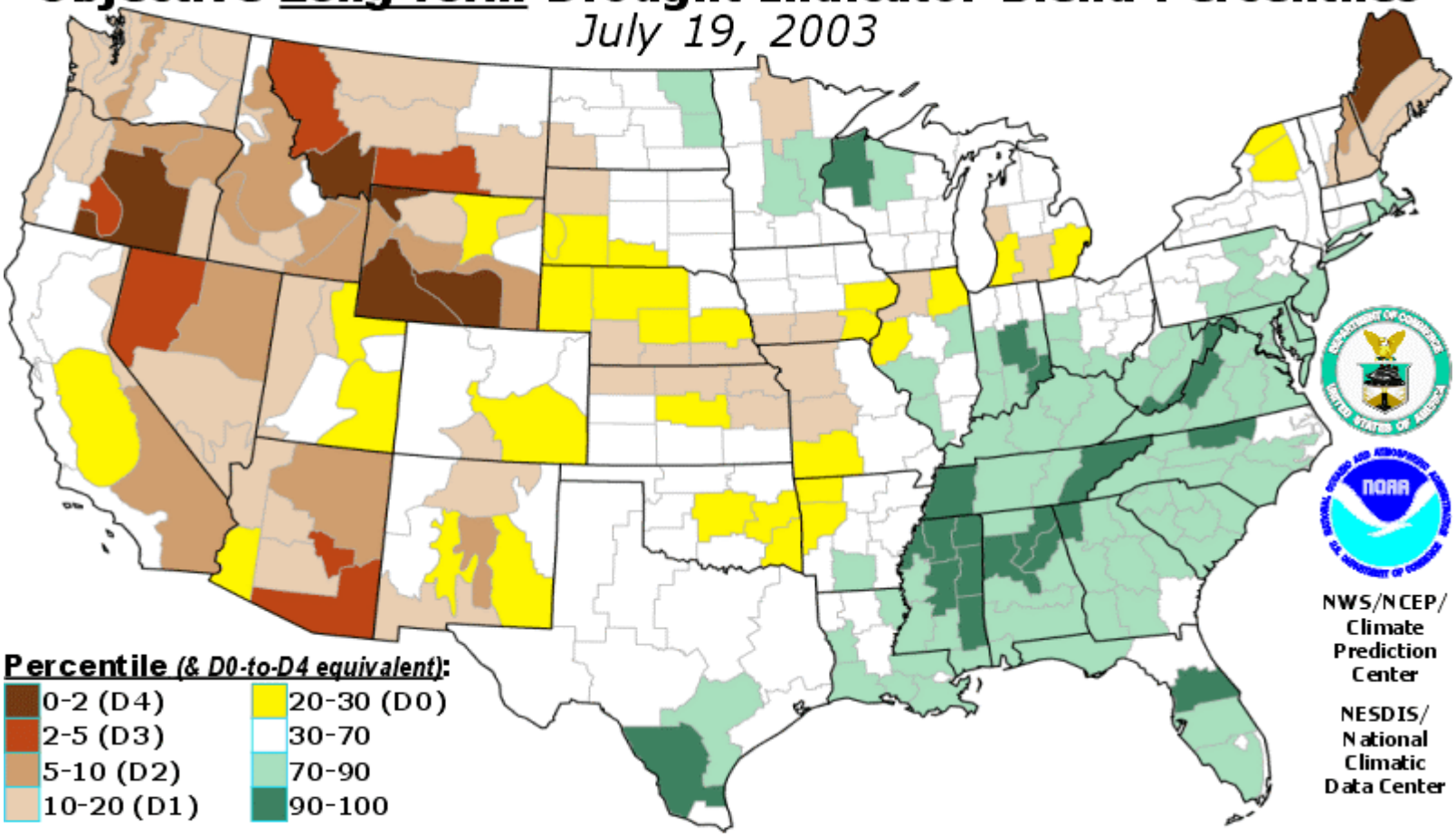
— MEDIAN DAILY STREAMFLOW BASED ON 78 YEARS OF RECORD

× MEASURED Discharge

Provisional Data Subject to Revision

Objective *Long-Term* Drought Indicator Blend Percentiles

July 19, 2003



Percentile *(& D0-to-D4 equivalent)*:

0-2 (D4)	20-30 (D0)
2-5 (D3)	30-70
5-10 (D2)	70-90
10-20 (D1)	90-100

NWS/NCEP/ Climate Prediction Center

NESDIS/ National Climatic Data Center

INPUTS (as Percentiles):

25% Palmer Hydrologic Index
20% 24-Month Precipitation
20% 12-Month Precipitation
15% 6-Month Precipitation
10% 60-Month Precipitation
10% CPC Soil Model

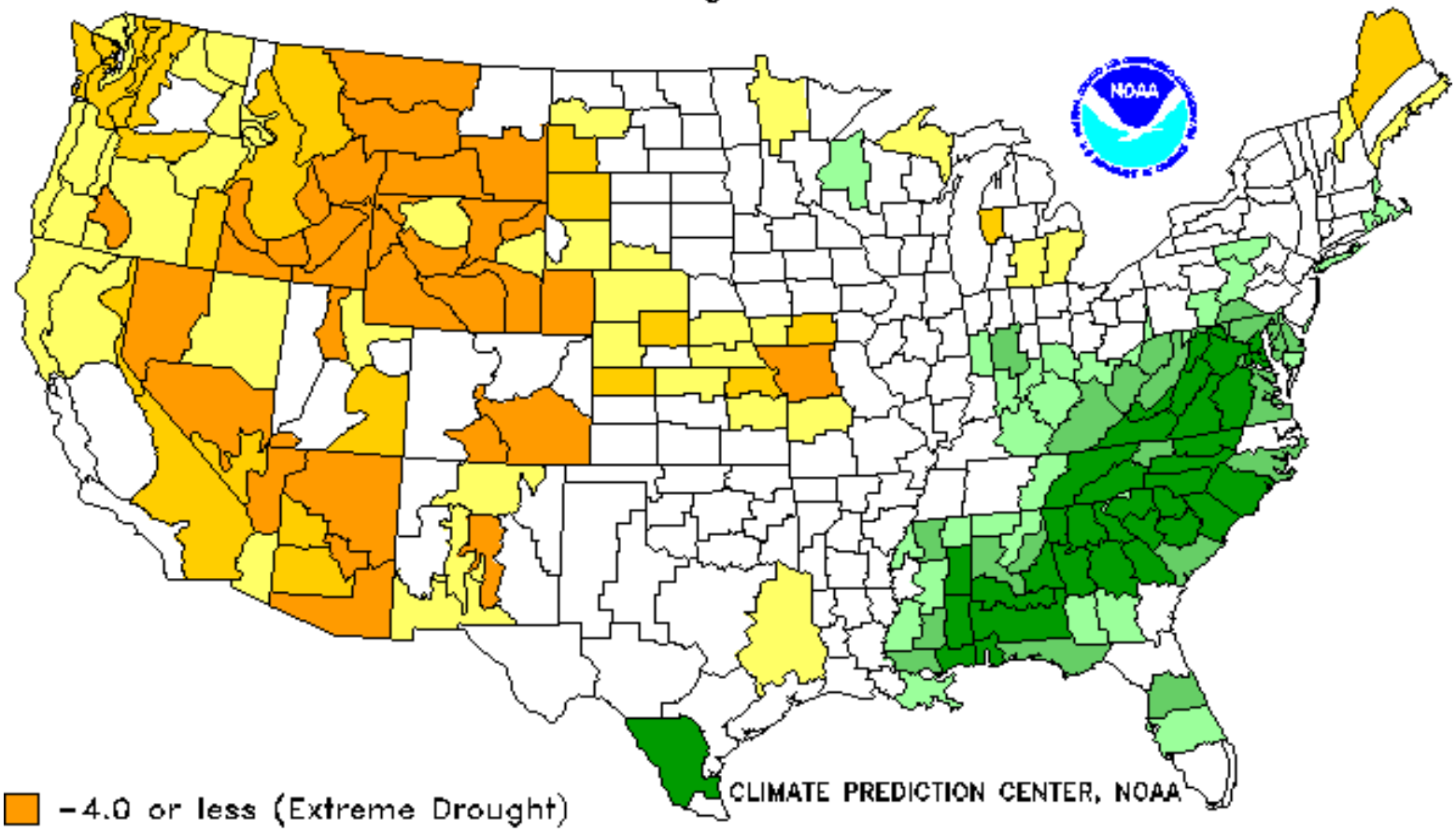
This map approximates impacts that respond to precipitation over several months to a few years, such as reservoir content, groundwater depth, and lake levels.

This map is based on preliminary climate division data. Local conditions and/or final data may differ. **The relationship between indicators and water supplies can vary markedly with location, season, source, and management practices.** Do not interpret this map too literally. See full product description for more details.

Drought Severity Index by Division

Weekly Value for Period Ending 19 JUL 2003

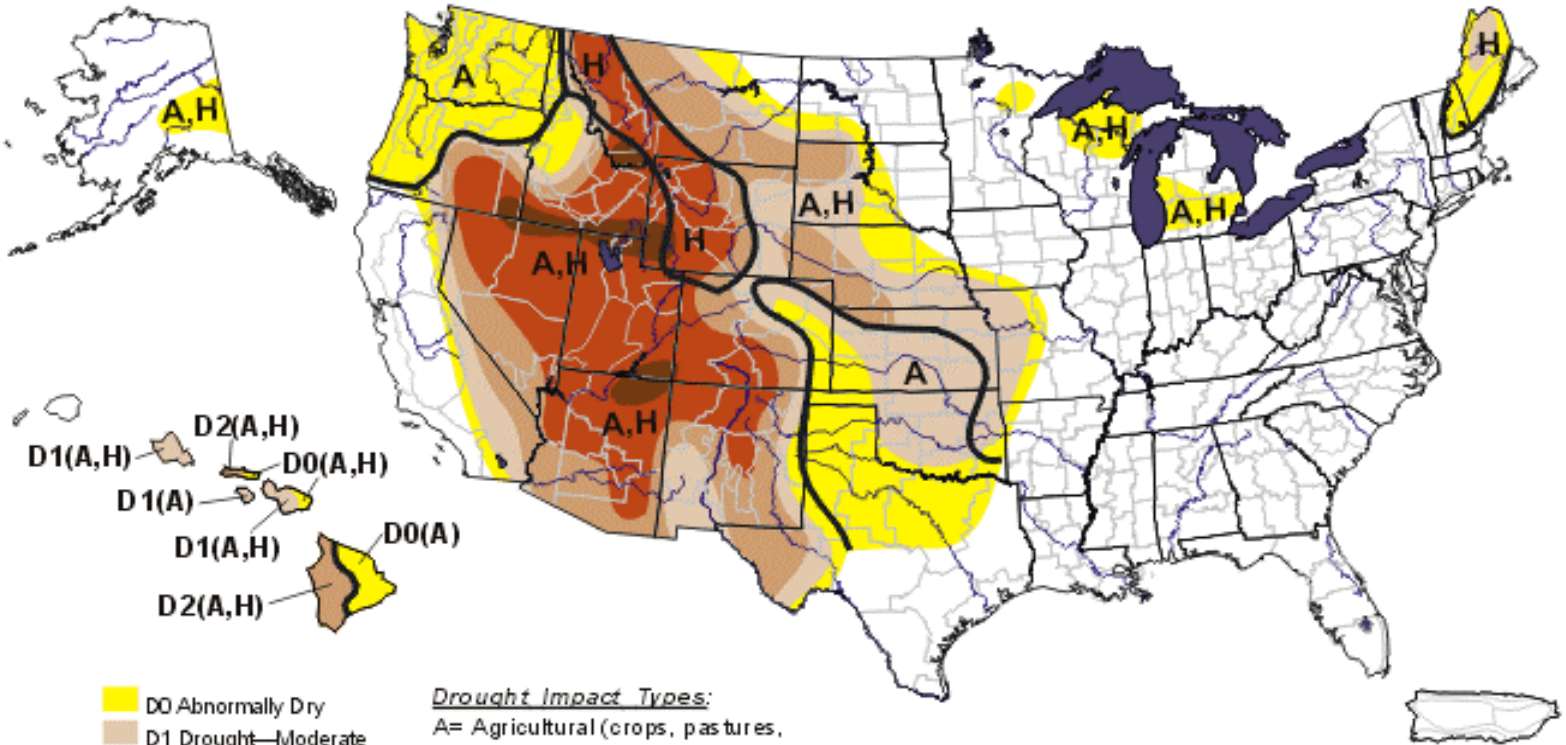
Long Term Palmer



- −4.0 or less (Extreme Drought)
- −3.0 to −3.9 (Severe Drought)
- −2.0 to −2.9 (Moderate Drought)
- −1.9 to +1.9 (Near Normal)
- +2.0 to +2.9 (Unusual Moist Spell)
- +3.0 to +3.9 (Very Moist Spell)
- +4.0 and above (Extremely Moist)

U.S. Drought Monitor

July 22, 2003
Valid 8 a.m. EDT



D0 Abnormally Dry
D1 Drought—Moderate
D2 Drought—Severe
D3 Drought—Extreme
D4 Drought—Exceptional

Drought Impact Types:
A= Agricultural (crops, pastures, grasslands)
H= Hydrological (water)
No type = both impacts
Delineates dominant impacts

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

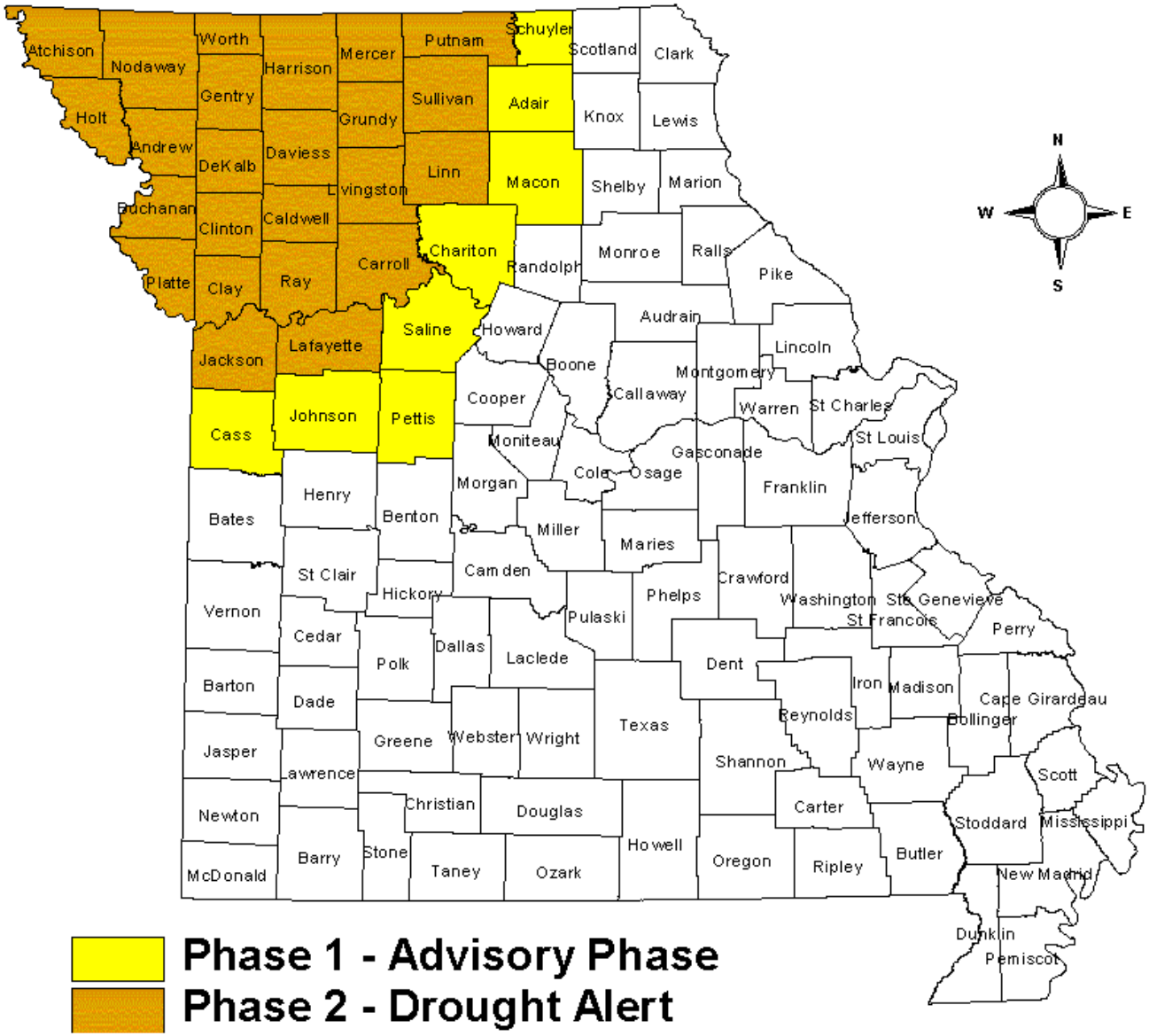
http://drought.unl.edu/dm

USDA — National Drought Mitigation Center — NOAA

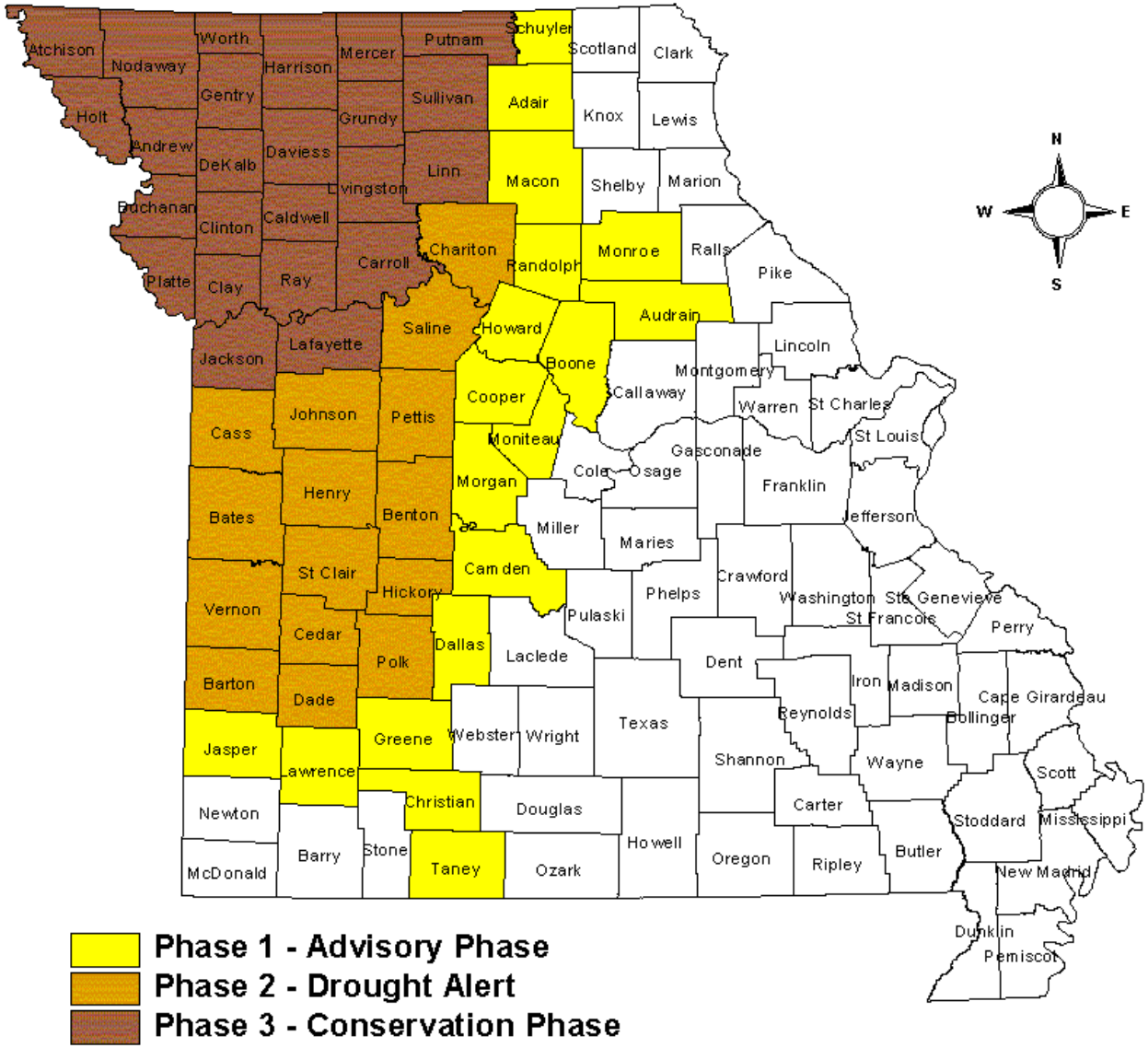
Released Thursday, July 24, 2003

Author: *Brad Rippey, USDA*

Drought Condition Status (May 20, 2003)



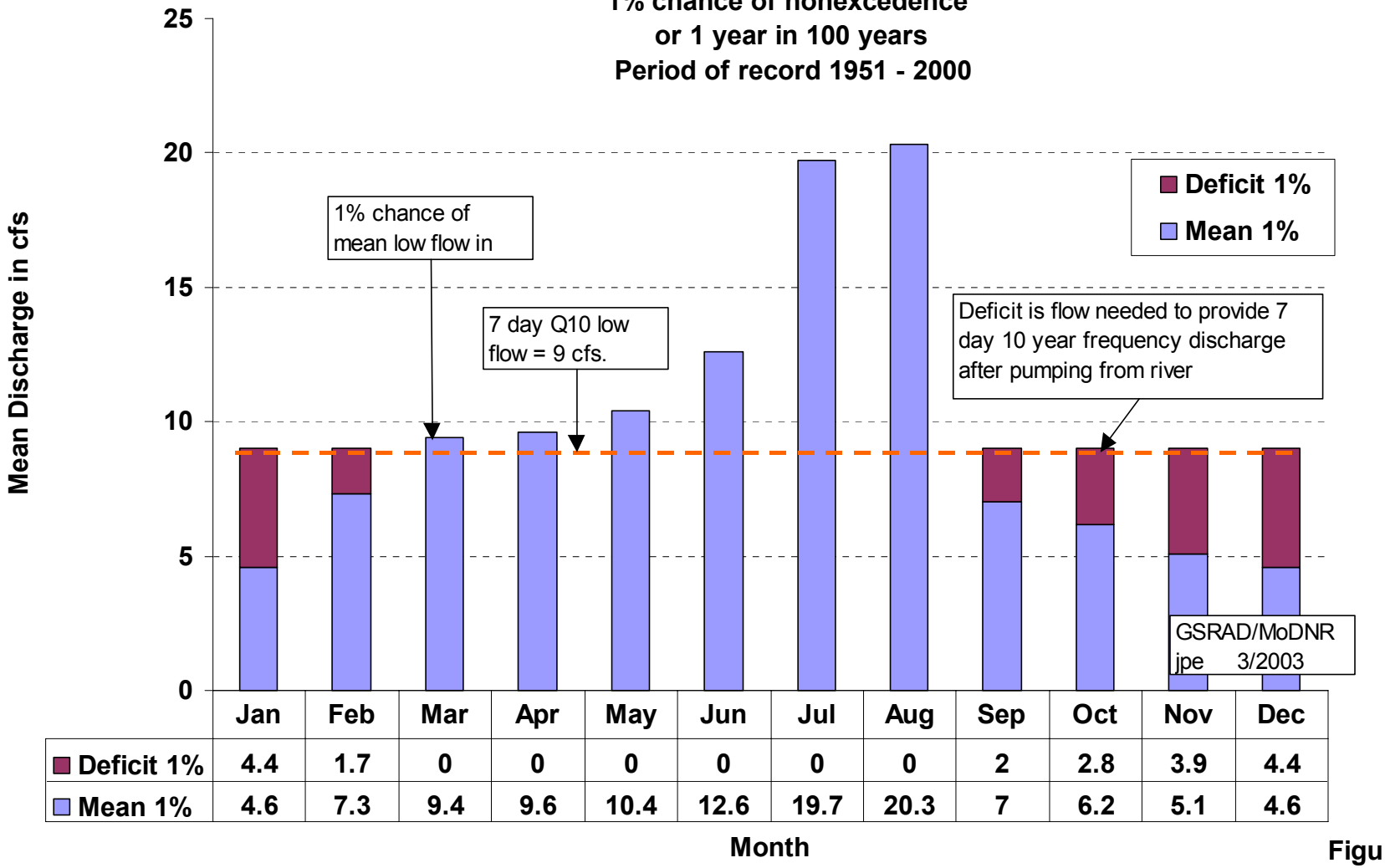
Recommended Drought Status (July 25, 2003)



Thompson River

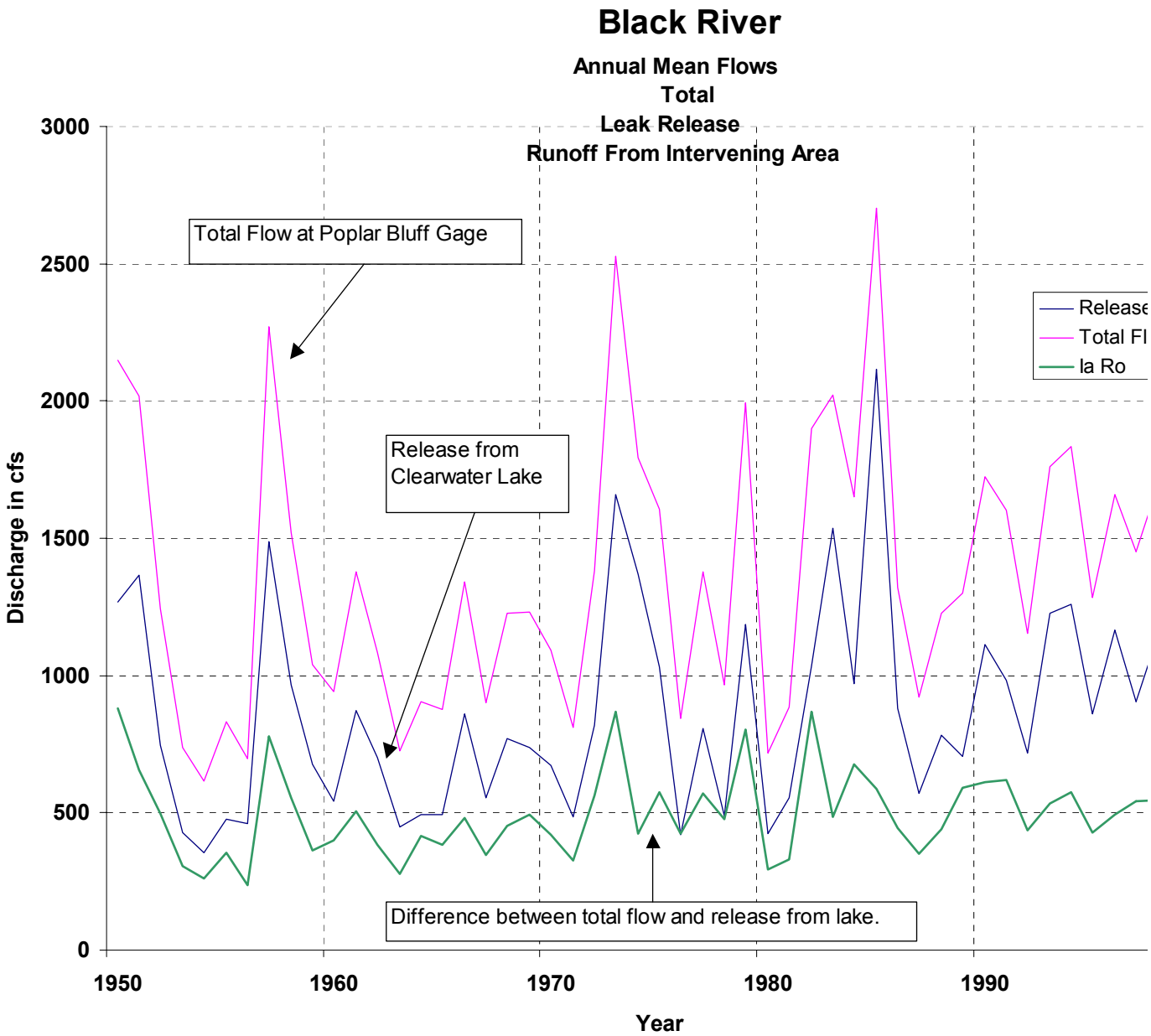
fn = freq-defi

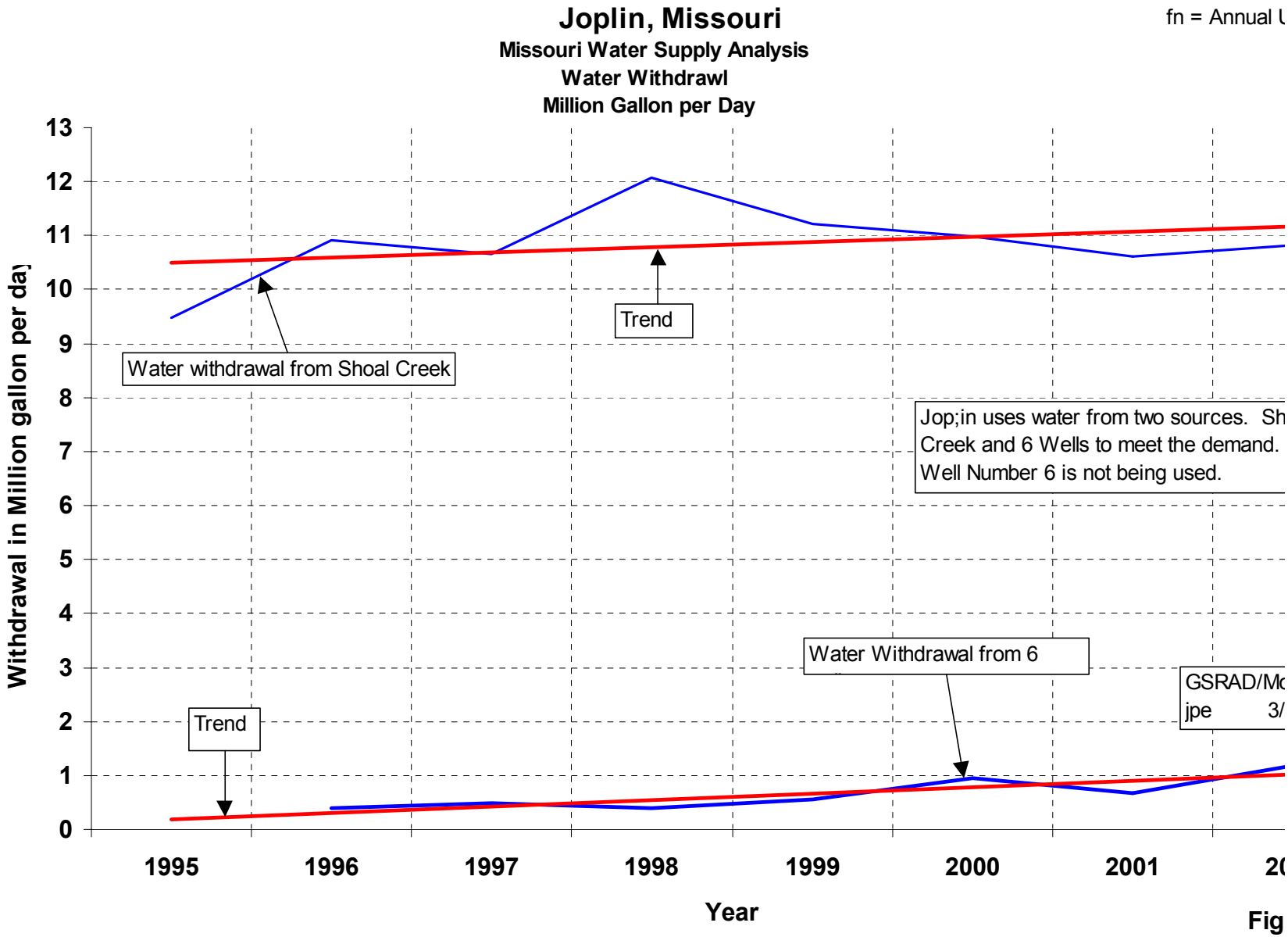
Trenton, Missouri
Low Flows
1% chance of nonexcedence
or 1 year in 100 years
Period of record 1951 - 2000

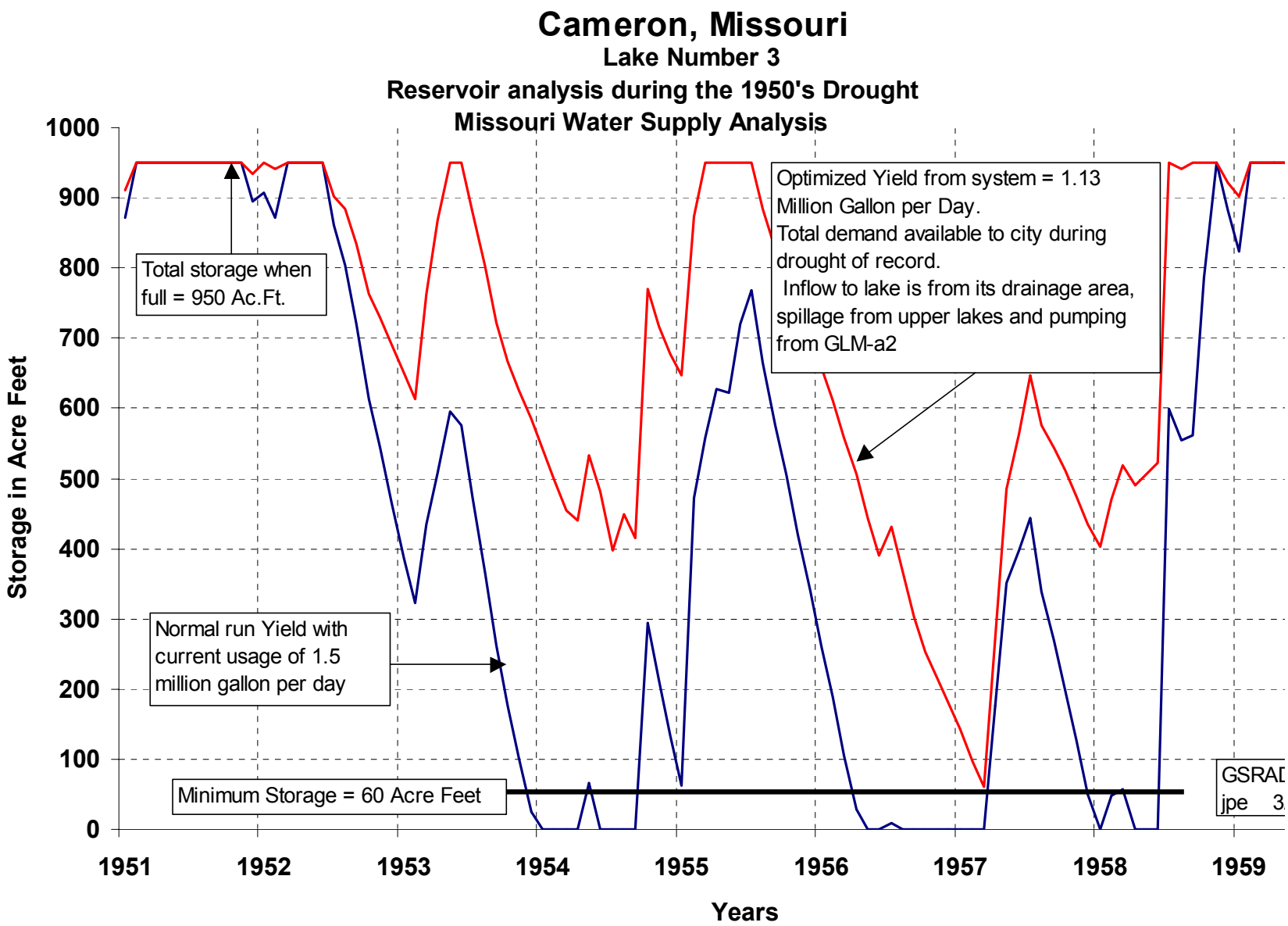


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Deficit 1%	4.4	1.7	0	0	0	0	0	0	2	2.8	3.9	4.4
Mean 1%	4.6	7.3	9.4	9.6	10.4	12.6	19.7	20.3	7	6.2	5.1	4.6

Figu


Black River
Annual Mean Flows
Total
Leak Release
Runoff From Intervening Area
Total Flow at Poplar Bluff Gage
Release from Clearwater Lake
Difference between total flow and release from lake.
Release
Total Fl
la Ro
Discharge in cfs
3000
2500
2000
1500
1000
500
0
1950
1960
1970
1980
1990
Year


Joplin, Missouri
Missouri Water Supply Analysis
Water Withdrawl
Million Gallon per Day
fn = Annual U
Withdrawal in Million gallon per day
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1995
1996
1997
1998
1999
2000
2001
Year
Water withdrawal from Shoal Creek
Trend
Jop;in uses water from two sources. Sh
Creek and 6 Wells to meet the demand.
Well Number 6 is not being used.
Water Withdrawal from 6
Trend
GSRAD/Mc
jpe 3/
Fig

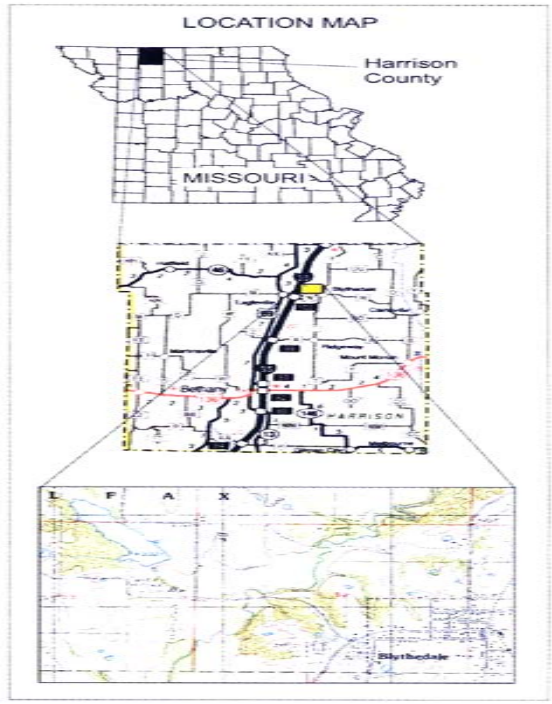

Cameron, Missouri
Lake Number 3
Reservoir analysis during the 1950's Drought
Missouri Water Supply Analysis
Storage in Acre Feet
1000
900
800
700
600
500
400
300
200
100
0
1951
1952
1953
1954
1955
1956
1957
1958
1959
Years
Total storage when full = 950 Ac.Ft.
Optimized Yield from system = 1.13 Million Gallon per Day.
Total demand available to city during drought of record.
Inflow to lake is from its drainage area, spillage from upper lakes and pumping from GLM-a2
Normal run Yield with current usage of 1.5 million gallon per day
Minimum Storage = 60 Acre Feet
GSRAD
jpe 3

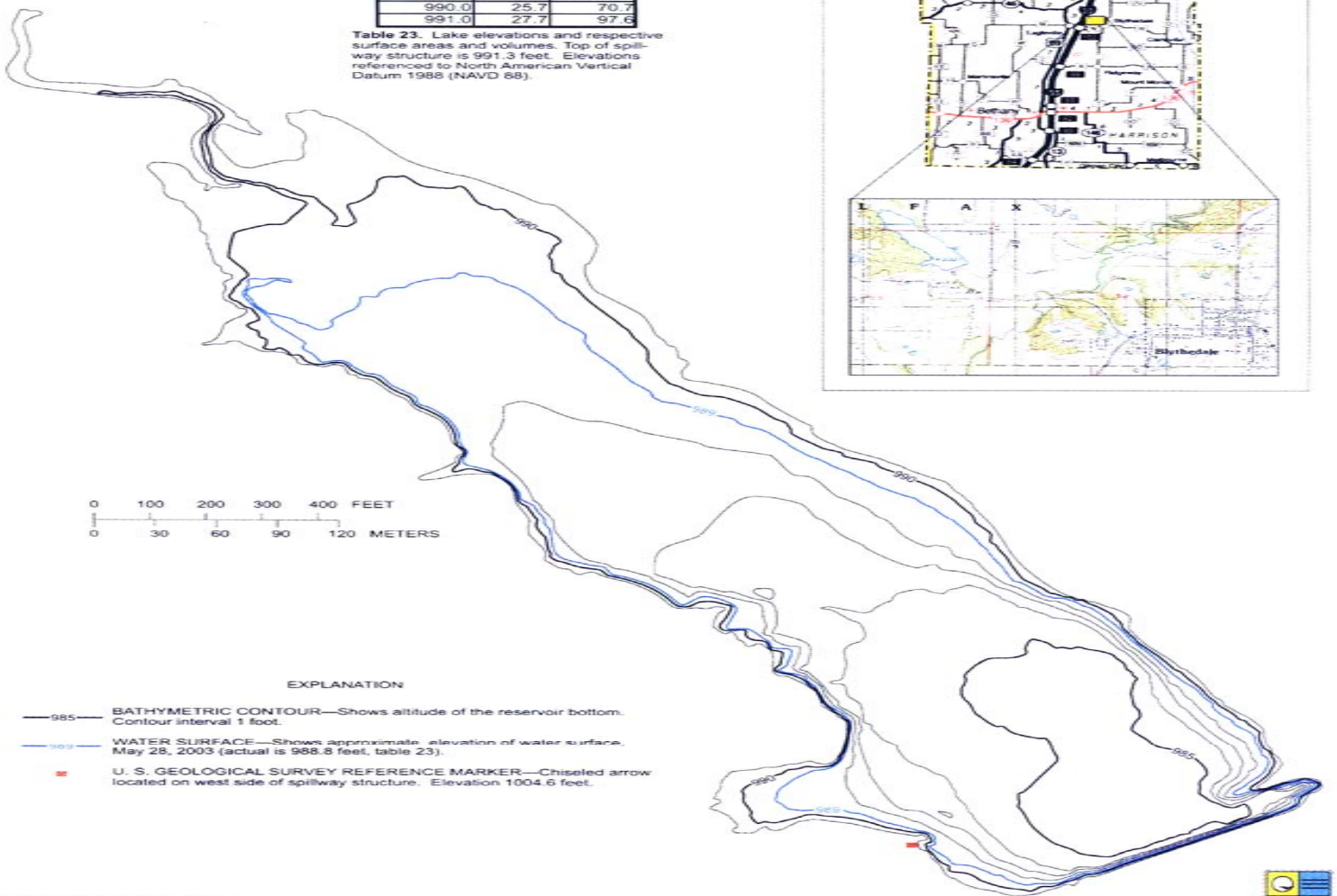
Eagleville Reservoir Winter 2002-2003

EAGLEVILLE LAKE

Elevation (feet)	Area (acres)	Volume (acre-ft)
985.0	3.4	1.0
986.0	7.9	6.8
987.0	11.4	16.4
988.0	15.3	29.8
989.0	20.7	47.4
990.0	25.7	70.7
991.0	27.7	97.6

Table 23. Lake elevations and respective surface areas and volumes. Top of spillway structure is 991.3 feet. Elevations referenced to North American Vertical Datum 1988 (NAVD 88).





USGS science for a changing world

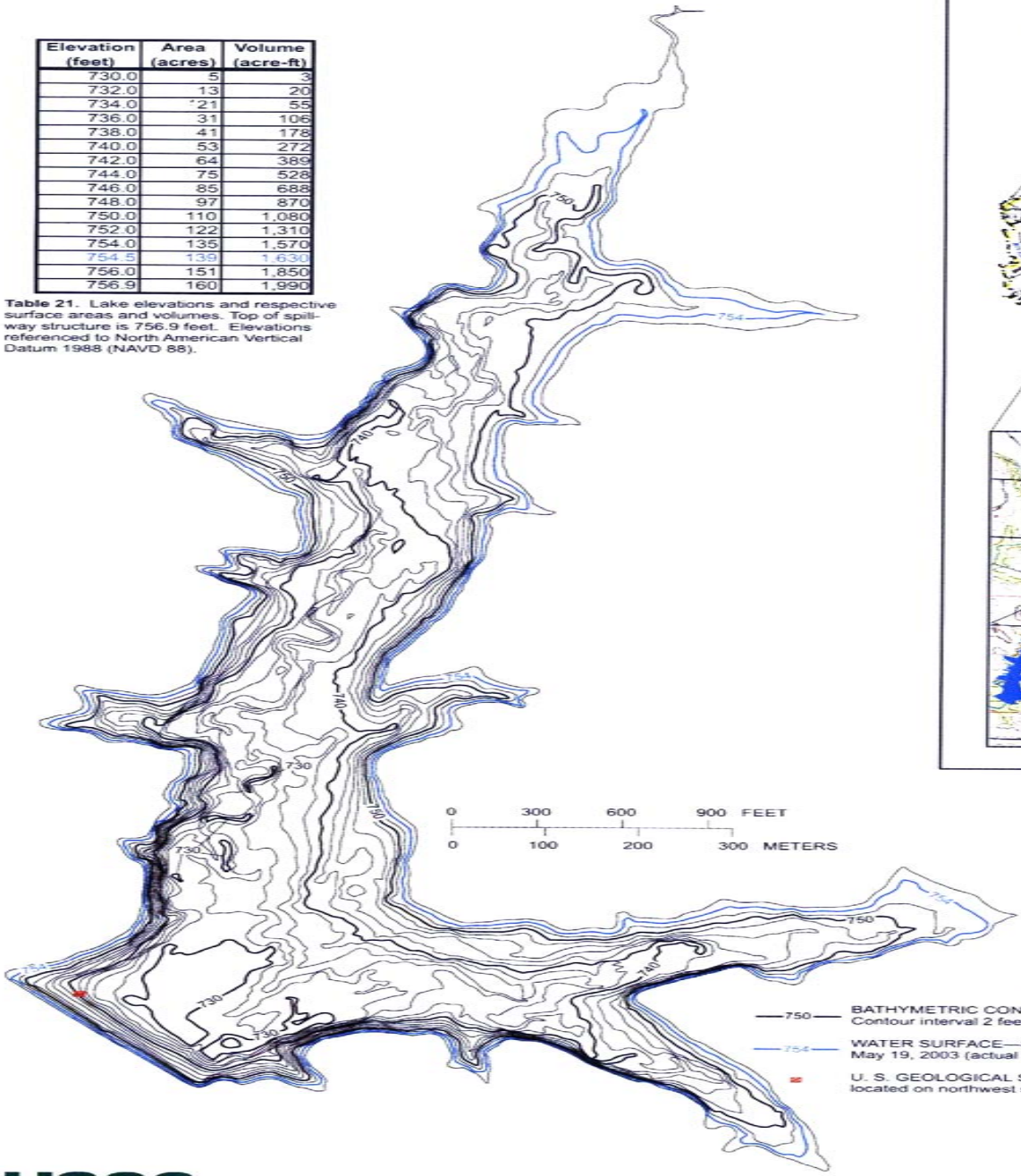
Figure 23. Bathymetric map and table of areas/volumes of Eagleville Lake near Blythedale, Missouri.

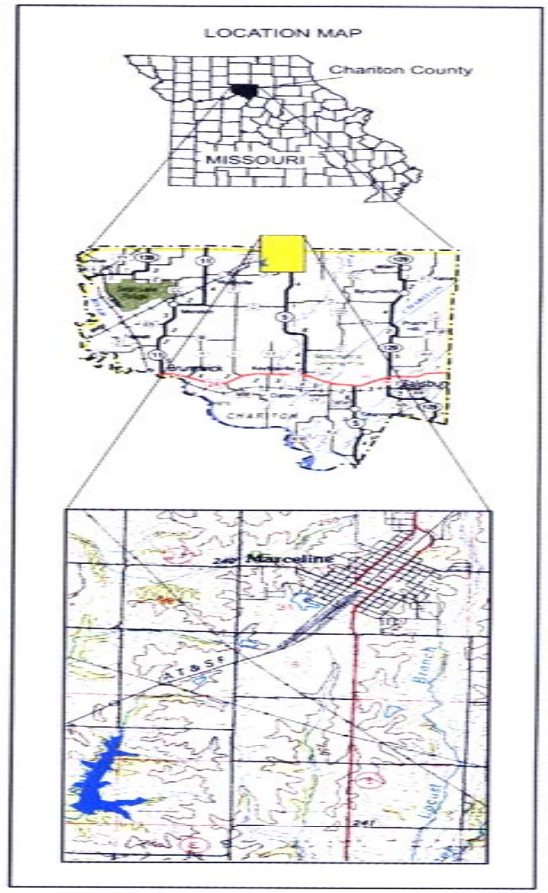
In cooperation with Missouri Department of Natural Resources

MARCELINE LAKE

Elevation (feet)	Area (acres)	Volume (acre-ft)
730.0	5	3
732.0	13	20
734.0	21	55
736.0	31	106
738.0	41	178
740.0	53	272
742.0	64	389
744.0	75	528
746.0	85	688
748.0	97	870
750.0	110	1,080
752.0	122	1,310
754.0	135	1,570
754.5	139	1,630
756.0	151	1,850
756.9	160	1,990

Table 21. Lake elevations and respective surface areas and volumes. Top of spillway structure is 756.9 feet. Elevations referenced to North American Vertical Datum 1988 (NAVD 88).





EXPLANATION

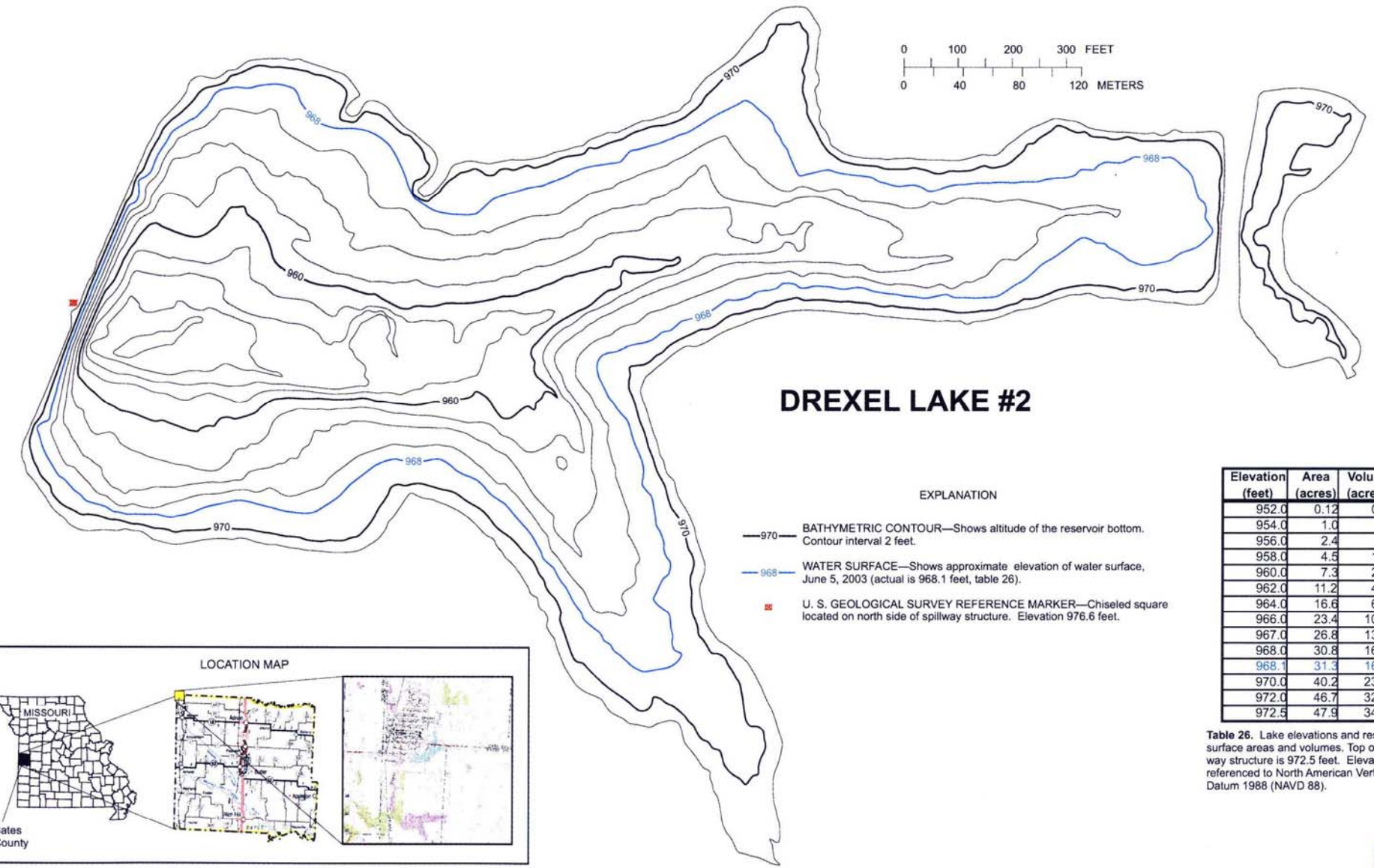
750 — BATHYMETRIC CONTOUR—Shows altitude of the reservoir bottom. Contour interval 2 feet.

754 — WATER SURFACE—Shows approximate elevation of water surface, May 19, 2003 (actual is 754.5 feet, table 21).

U. S. GEOLOGICAL SURVEY REFERENCE MARKER—Chiseled arrow located on northwest side of intake tower. Elevation 764.1 feet.

USGS

Figure 21. Bathymetric map and table of area/volumes of the Marceline Lake (New) near Marceline, Missouri, ...



Elevation (feet)	Area (acres)	Volume (acre-ft)
952.0	0.12	0.04
954.0	1.0	1.0
956.0	2.4	4.3
958.0	4.5	11.1
960.0	7.3	22.6
962.0	11.2	40.9
964.0	16.6	68.5
966.0	23.4	108.3
967.0	26.8	133.3
968.0	30.8	162.1
968.1	31.3	165.4
970.0	40.2	233.4
972.0	46.7	321.5
972.5	47.9	345.1

Table 26. Lake elevations and respective surface areas and volumes. Top of spillway structure is 972.5 feet. Elevations referenced to North American Vertical Datum 1988 (NAVD 88).

USGS
ce for a changing world

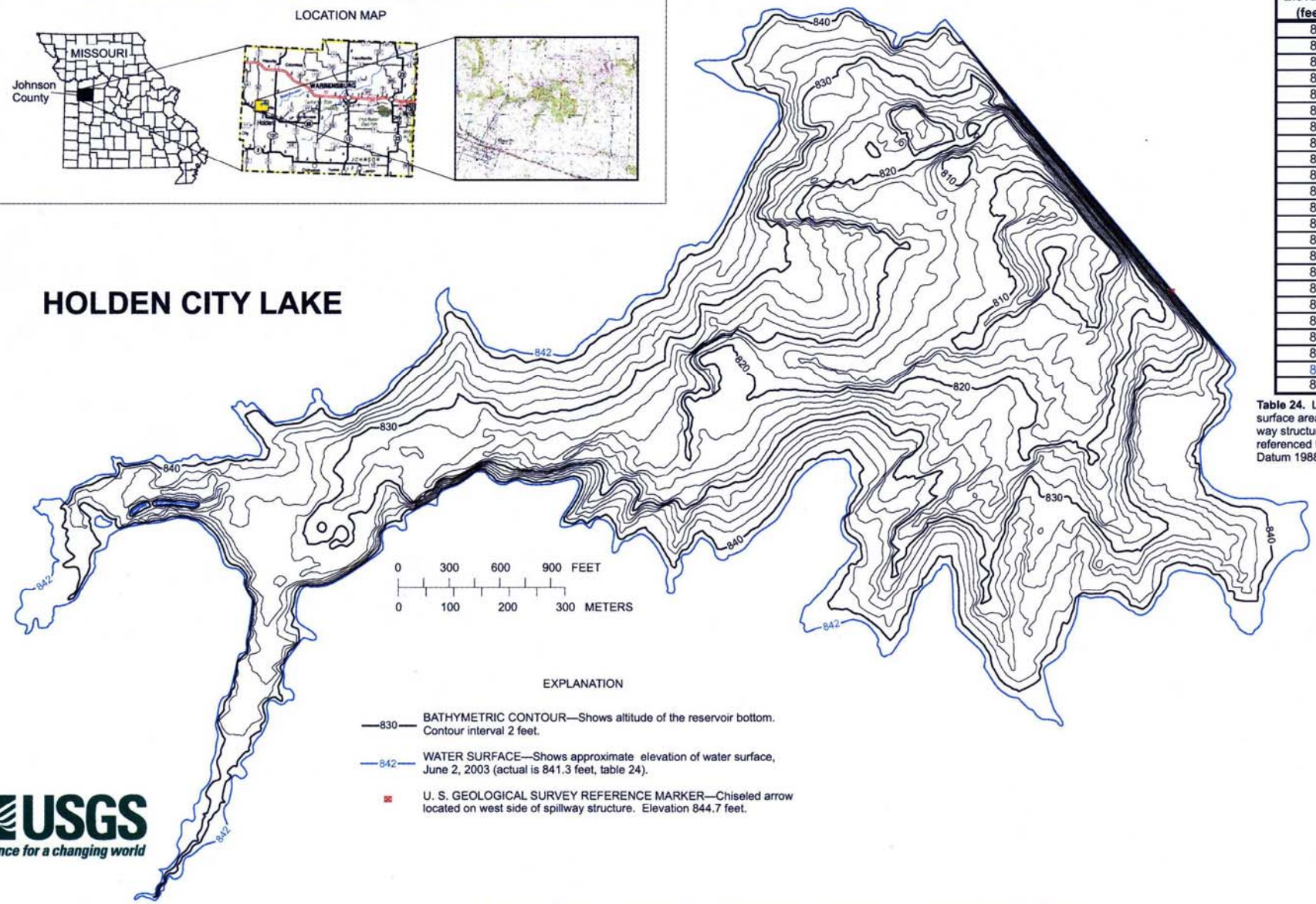
Figure 26. Bathymetric map and table of areas/volumes of Drexel Lake #2 near Drexel, Missouri.

In cooperation w
Missouri Departm
of Natural Resour

HOLDEN CITY LAKE

Elevation (feet)	Area (acres)	Volume (acre-ft)
802.0	0.07	0.0
804.0	1.0	0.8
806.0	3.2	4.9
808.0	6.2	14
810.0	10	31
812.0	17	58
814.0	26	101
816.0	36	162
818.0	47	245
820.0	58	350
822.0	74	480
824.0	90	650
826.0	105	840
828.0	124	1,070
830.0	143	1,340
832.0	162	1,640
834.0	184	1,990
836.0	207	2,380
837.0	222	2,590
838.0	237	2,820
840.0	262	3,320
841.3	277	3,670
841.8	292	3,810

Table 24. Lake elevations and respective surface areas and volumes. Top of spillway structure is 841.8 feet. Elevations referenced to North American Vertical Datum 1988 (NAVD 88).



USGS
nce for a changing world

Figure 24. Bathymetric map and table of areas/volumes of the Holden City Lake near Kingsville, Missouri.

In cooperation wit
Missouri Departme
of Natural Resourc